DOCUMENT RESUME

ED 069 710 TM 002 162

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TITLE	The Measurement of Socio-Economic Status: A Technical Note.
INSTITUTION	Toronto Board of Education (Ontario). Research Dept.
PUB DATE	Feb 69
NOTE	33p.
EDRS PRICE	MF-$0.65 HC-$3.29
DESCRIPTORS	Academic Achievement; Elementary Grades; Kindergarten; *Measurement Instruments; *Socioeconomic Status; Statistical Data; *Test Construction; Test Reliability; *Test Validity
IDENTIFIERS	Blishen Socio Economic Index; Warners Index of Social Class

ABSTRACT

A review of the socioeconomic status (SES) concept was conducted to determine whether an already established index could be used in Toronto's Study of Achievement of children from kindergarten through the elementary grades. The examination of the SES concept and the results of analyses concerning the applicability of the Blishen Socio-Economic Index are presented. The results indicated that Blishen's index was suitable for the Study of Achievement sample population since (1) it was constructed using Canadian data and (2) the results of preliminary regression analyses established that income and education were the two variables sufficient to construct a scale for SES. Appendix A presents an outline of Warner's Index of Social Class because its general methodology has been useful in the construction of SES indices. Appendix B presents five statistical tables and Appendix C presents the detailed procedures used to establish validity between Blishen's index and the Study of Achievement sample. (Author/JS)

ED 069710

RESEARCH SERVICE

issued by the
Research Department

TM 003 162

THE BOARD OF EDUCATION FOR THE CITY OF TORONTO

ED 069710

THE MEASUREMENT OF SOCIO-ECONOMIC STATUS: A TECHNICAL NOTE

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Patricia Crawford

February, 1969

PREFACE

The concept of socio-economic status (SES) is frequently invoked as one means of explaining the variability usually found in attitudes related to the home and to the school. It is often assumed that if information is available for one of these concepts (i.e. SES or attitudes) that it is possible to infer that you have information about the other one. This is not necessarily the case. In order to be able to examine the relationship among SES, attitudes and school achievement more carefully, it was felt that the starting point should be the establishment of a good measure of SES.

There have been numerous indices devised to measure SES which have been based on combinations of a number of different factors (e.g., father's occupation and education, family income, dwelling area, etc.). In order to determine whether a specific index already established could be used with the population of the Study of Achievement, it was important to determine whether the factors on which this index was based (i.e. income and education) really did provide the best predictors of SES. The following paper describes this examination of the concept of SES and the results of analyses concerning the applicability of one index to the Study of Achievement population. For the interested reader, a separate appendix is provided which outlines in further detail the nature of the statistical procedures used.

Patricia Crawford

THE MEASUREMENT OF SOCIO-ECONOMIC STATUS: A TECHNICAL NOTE

Since 1960, the Board of Education for the City of Toronto has been engaged in a study of achievement of children from kindergarten through the elementary grades. A premise of this study has been that there are relationships between the home and school environments of children which affect their academic, social, cultural, emotional, and physical development. Bloom (1964) and other researchers in recent years have investigated these relationships with emphasis on a description of the home environment since its influences on the child appear to be more constant and more uniform in frequency and quality. The viewpoint that a motivational set toward school is taught in the home has led some to claim that elements of the pre-school home environment establish the pattern of academic achievement throughout the child's life. In a previous publication of the Research Department, Palmer (1967) presented a review of literature pertaining to the relationship between home environment and achievement. This review led to the conclusion that "the powerful influence of the home on the motivation and achievement of the child is an undeniable reality." (p. 19). The present paper is a continuation of the Research Department's efforts to identify relationships between the home and school environments, and to draw out the implications of such findings for the benefit of all members of the school system, including the children.

In the previous publication (Palmer, 1967), a number of studies were cited which suggest that the socio-economic status (SES) of a family may act as a summary statement for a host of attitudes held by the parents which ultimately affect a child's achievement. Consequently, it was decided that this suggestion should be tested in order to give support and direction to the study of specific home environmental variables which

affect school achievement. This paper will review the concept of SES, introduce the construction of the socio-economic index (SEI) which will be used in future research, and comment on the value of applying the SEI in the study of home and school environments.

In the course of the longitudinal Study of Achievement, a large data bank has been established. This now contains information about the progress of some seven hundred children through the elementary grades and includes the results of several tests of achievement, teacher rating scales, and a detailed survey of parental attitudes and child-rearing practices. It is from this latter category that information is available concerning factors such as income, education of parents, house type, occupation and perceived social class. These are the variables which are most commonly considered when SES measures are taken.

After establishing the method and statistical significance of a socio-economic index in this paper, a future paper will present information concerning the relationship of SES to individual measures of academic performance, and to parental values, child rearing practices, and attitudes toward education. Analyses such as these should lead to a better understanding of factors in the home environment which are related to a child's performance in the school environment.

Review of Literature

In the past thirty years, many indices have been devised to estimate SES. A comparative review (Kahl and Davis, 1955) of nineteen such indices, developed during the years 1935-1955, indicated that all estimates measured the same underlying dimension, although to varying degrees. Factors related to this dimension included husband's occupation and education, wife's education, type of living accommodation and amount

of family income. Since each of these factors is associated with a measurable scale such as dollars or years of education, they provide objective measures which allow the sociologist to test his theories of SES. This should clarify future discussion, since it points out that there is more than one interpretation of SES. It may refer to practical measurement involving the above factors and scales derived from them or it may refer to inferences drawn from a theoretical model.

In the theoretical sense, SES has been considered as that which is common to the above measures and which accounts for some of a person's behaviour with another person, or with groups of persons. In particular, SES has been used to account for differential positioning of persons within the social hierarchy. With respect to occupations, this has been done by the construction of scales or indices which allow a concise assessment of the various status positions in the occupational structure of society.

Scales differ in the ways in which they attempt to measure the underlying dimension, SES. Two major approaches have been developed, the subjective and the objective approaches. The subjective approach has been employed in small communities where social interaction has supplied each member of the community with some knowledge of the majority of other members. Each member of the group is asked to evaluate some of the other members, or himself, on a variety of measures such that his relative position in the community can be evaluated by the social scientist. The subjective approach was employed in Hollingshead's (1949) study of the people in Elmstown. In large urban centres, however, the assumption that persons have knowledge of the majority of "others" in the community is not usually valid. This has resulted in almost exclusive use of the objective approach in which the data obtained about each individual are compared to the total

sample and a status position is computed based on his relative standing within the sample.

When a very simple method of assessing SES has been required in research, most sociologists have agreed that occupation is a usable and valid index of SES. The argument in favour of this has been presented by Duncan:

> "A man qualifies himself for occupational life by obtaining an education; as a consequence of pursuing his occupation he obtains income. Occupation therefore, is the intervening activity linking income to education. If we characterize an occupation according to the prevailing levels of education and income of its incumbents, we are not only estimating its 'social status' and its 'economic status,' we are also describing one of its major 'causes' and one of its major 'effects! It would not be surprising if an occupation's 'prestige' turned out to be closely related to one or both of these factors."
>
> (Duncan, as quoted by Reiss, 1961)

The "prestige" of a position in society (i.e. the prestige of a certain socio-economic position), as viewed by Reiss (1961), is the combination of all the rewards attached to that position. These rewards may take the form of financial gain, or advantageous working conditions to name two. It is also Reiss' contention that a fully accurate index of SES should reflect an individual's <u>total position</u> in society. For this reason he cautions against taking occupation as the sole basis for an index of SES as it does not reflect a second factor, esteem, which he feels is important in estimating total position. "Esteem" refers to the respect and reputation bestowed by others as a reward for fulfilling the community's expectations associated with a given status in addition to the more concrete rewards such as income, property, and standard of living. With every subjective perception of a different social class by a member of the community,

there are certain sets of behaviour expected. Certain cultural activities, such as the opera or the ballet for example, are usually attended in North American culture by the elite of the community. The same activities are less expected of members of the lower status groups. Thus for Reiss, SES involves both personal gain and the evaluation by others of the ability to fulfil their expectations of that status.

Warner's book Social Class in America (1949) presents a set of procedures for social scientists who wish to identify quickly and easily both the class levels of a community and the SES of a particular individual or family within that community. It is a practical method which is intended to be an operational definition of the theoretical concept of SES. Four socio-economic status characteristics were selected which were believed to be reasonable measures of what Reiss has described as the prestige and esteem components of the theoretical concept of SES. The four characteristics were: (1) occupation; (2) source of income; (3) house type; (4) education.

Each of the characteristics was assessed on a seven point scale, with the lowest number associated with the highest SES position. In Warner's original index of social class each of the characteristics was assigned the same weight on the assumption that each was contributing equally to the overall status of the individual. Subsequent research pointed out that, since there were correlations[1] between each of the SES characteristics, as explained above by Duncan, the status characteristics should be differentially weighted. This means that the status characteristics should have multipliers which mathematically eliminate the effect of the correlation between the characteristics. In its final form, Warner's procedure may

---

1 Correlation: A statistical term referring to the fact that many variables or events in nature are related to each other, e.g., the temperature out of doors varies as the position of the sun, or in this case education is related in some measurable way to occupation.

be represented by an equation which yields an index of social class (ISC) as follows:

$$ISC = (4) \text{ occupation} + (3) \text{ source of income} + (3) \text{ house type} + (2) \text{ education}^{2}$$

Warner's method has been presented in this review since it is possibly the best known technique and it is informative concerning the general methodology used in the construction of many indices of SES. Since Warner's scale was developed in the United States in 1949 on the population of a small town, it was thought more appropriate to choose a scale more recently validated on a Canadian population for use with the Study of Achievement data.

In 1958 Bernard Blishen (revised 1967) undertook a pioneering study to establish an SEI appropriate for the Canadian population. His method was similar to Warner's and achieved an estimate of SES through the classification of each of 320 male occupations listed in the 1951 Canadian Census[3]. The Blishen procedure assigns weights to income and education in a manner similar to the Warner procedure described above.

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2 In order to gain an understanding of the way in which these four characteristics are evaluated and combined to give an index of social class, the reader may be interested in rating himself on Warner's index, which has been reproduced in Appendix A.

3 Blishen, 1967:

> "The data are based on a total enumeration of the labour force, which includes 'all persons 15 years of age and over, who were reported as having a job of any kind, either part-time or full-time (even if they were not at work) or were reported as looking for work, during the week prior to enumeration.' The definition of educational level used was 'the highest grade or year of schooling ever attended.' The data on education were reported for all occupations whereas the data on income, taken from the 20% sample noted above, were reported for a more limited number of occupations. The socio-economic index was calculated for the more limited list of occupations." (p. 43)

A brief word about Blishen's technique may be helpful to clarify how it differs from Warner's, and how this technique was applied in the Study of Achievement. Blishen, like Warner and Reiss, felt that the assessment of the social class of a person involved the evaluation of that person's prestige. Following Kahl and Davis' (1955) finding that occupational position was a factor underlying all of the socio-economic scales they investigated, Blishen argued that prestige could best be evaluated by ranking occupational titles. It has been found that persons in the general population rank order occupational titles according to the degree of specialized training required and the amount of responsibility involved in the particular occupation. Blishen felt that these two factors could be objectively measured by the number of years of education and the level of income of the average incumbent of the particular occupation respectively. It is some combination of these two factors which will yield a best estimate of the position of a particular occupation on a scale. As in Warner's method, the effect of the correlation between income and education (see Appendix B, Table 5) was eliminated by employing weighting factors. The weights used in Blishen's index were 0.202 for income, and 0.347 for education of the father. To account for the contribution of other factors associated with SES but not measured by the two characteristics, income and education, a residual term of 24.62 is included in Blishen's equation for SEI.

$$SEI = 0.202(A) + 0.347(B) + 24.62$$

where A is the percentile[4] rank of the individual's income level in the population;

and

where B is the percentile rank of the individual's educational level in the population.

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4 Percentile Rank: This is the percentage of scores having a value less than or equal to the stated value. In the example, it is implied that 59 of every hundred in the sample had an annual income of less than or equal to $5,000 - $5,999.

For example, in the Study of Achievement population, a family having an income of $5,000 - $5,999 has a percentile rank of 59.44. If the father's educational level was less than eight years, then he would be at the 44.01 percentile rank (see Appendix B, Tables 1 and 2).

The SEI for this family would be calculated as follows:

$$\begin{aligned} SEI &= 0.202(A) + 0.347(B) + 24.62 \\ &= 0.202(59.44) + 0.347(44.01) + 24.62 \\ &= 12.00 + 15.27 + 24.62 \\ &= 51.89 \end{aligned}$$

This value of SEI would be interpreted as showing that the family held a position in the hierarchy of social status which was above average and comparable to teachers, managers of small stores, or administrators of small businesses (see Appendix B, Table 3).

Rationale for Using Blishen's Index

The validity of applying Blishen's SEI to the sample associated with the Study of Achievement rests on the assumption that this sample population is representative with respect to the more general Canadian population. The index could not be applied to the Study of Achievement population sample if it contained an over-representation of persons within a particular income or educational level. Since generalization of the results of the Study of Achievement is restricted by the fact that not all school systems in Canada follow the same structural organization or act on the basis of the same policy, it was decided to compare the Study of Achievement sample with statistics concerning the population of Ontario. Using the data compiled from the interviews conducted with the parents of 721 children in Grade 5, it was possible to compare the distribution of family income, educational level of the father, and occupational level of the father, with data collected by the Dominion Bureau of Statistics (1961) (see Appendix B, Tables 1, 2 and 3). There are nine categories of income to represent a

range from less than $3,000 to greater than $15,000 per annum. The categories of educational level used in the parent interview were not identical to the categories used by the Dominion Bureau of Statistics (DBS) and therefore there was a slight loss of precision in applying Blishen's SEI to our sample. This may be corrected in future studies by using the same nine categories as the DBS. It was evident that the Blishen SEI was suitable for the Study of Achievement sample population since it was constructed using Canadian data and since preliminary regression analyses (see Appendix C) clearly established that income and education were the two variables sufficient to construct a scale for SES.

Application of Blishen's SEI[5]

Of the 721 families interviewed, complete data concerning income, education, and occupation were available for only 664. The data for each of these dimensions were classified as shown in Appendix B, Tables 1, 2, and 3 respectively. Three separate chi-square tests comparing percentages were used to test for differences between the Study of Achievement sample and the larger Ontario urban population on each of these three dimensions. No significant differences were found which indicates that the sample of parents interviewed is representative of the Ontario urban population. This finding in conjunction with the results of the regression analyses is important because it means that Blishen's index is a valid measure for use with the Study of Achievement population and that future findings may be generalized to the Ontario urban population. This is clearly shown in Appendix B, Table 4, which presents the cumulative percentage distribution of the Study of Achievement and Ontario samples by SEI. The home environment can thus now be characterized by the commonly used sociological measure, socio-economic status.

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5 Prior to the work reported in this paper, analyses with various other measures of SEI were conducted by Fred Switzer.

Discussion

Rather than concluding this paper with the bare facts of applicability of an index of socio-economic status to the Toronto sample involved in the Study of Achievement, it would be preferable to discuss briefly the more general aims of this phase of the study which have been outlined in another Research Department publication, Home Environment and Achievement (Palmer, 1967). The importance of study in this area is soundly established there.

> "The child's educational environment consists of the home, the classroom, the school, the community, the province, the nation and the interactions which go on between and within these institutions. The widening educational environment exerts an influence of successively decreasing individual intensity spread out over an ever widening population (Tuel and Wurster, 1965). This being the case, the family will exert intense influence on the young child. The family's role in the child's school success might be expressed through direct involvement with school and school work or it might provide a general attitudinal climate conducive to academic achievement. Conversely, the family might prove to be a negative factor with respect to education. In either case, the quality of the family's influence on the child's performance must be identified and evaluated before the educator can fully understand the child in the classroom."
>
> (Palmer, 1967, p. 1)

In an attempt to describe family attitudes and activities, some researchers have ascribed certain behaviours within the family to one "social class" level and other behaviours to another "social class" level. This has been fruitful in identifying areas which may yield more detailed descriptions of within-family activities which have consequences manifest in other units of social environment such as the school or business environments. This is the level of analysis which is represented by the application of Blishen's SEI to the Toronto sample. It has enabled the research to continue by refuting the hypothesis that the population should be considered

as a special case, a "city-core" population, and has shown that the home environments which will be discussed in future reports can be considered as typical of Ontario urban home environments with respect to the range and variability of resources of income and education available for the maintenance of family life.

The difficulty of pursuing the research at this level of analysis is that SES characteristics represent a very sweeping and non-specific description of the home. This point has been made by Dave:

> "Just as general index of intelligence or I.Q. has obscured many of the very important differences among individuals, so the general index of the social or economic status has obscured many of the very important differences among environments."
>
> (Dave, 1963, p. 6)

and,

> "Furthermore, the sociological characteristics possess very little functional value for the educator. They fail to provide practical hints to the teacher, counselor, and educational administrator as to what remedial action should be taken when the home environment is found to be deficient. The exact nature of the deficiency is rarely spelled out. The uniqueness of the environmental patterns of the individual pupils is also not taken into account."
>
> (Dave, 1963, p. 6)

Arguments such as these provide the rationale for the current emphasis in the Study of Achievement on the identification of specific features of the home environment which will lead to a better understanding of academic achievement on the basis of information from parent interviews. Dave's criticism of the nature of an SEI led to his development of an "Index of Educational Environment" (IEE). He argues that such an instrument would serve all levels of the educational system by providing information about a complementary and influential educational system, the family.

The present paper has presented a review of the concept of socio-economic status, and its measurement as well as an introduction to succeeding papers which will describe other variables of the home environment affecting school achievement. The analyses which will be reported in a following paper will establish whether or not there are home environmental factors which will relate to academic achievement to a higher degree than socio-economic variables. This technical paper demonstrates that: (a) Blishen's index for father's occupation is a legitimate substitute for the two variables of family income, and father's education and (b) as far as these variables are concerned the results may be generalized at least to other Ontario urban settings.

REFERENCES

Blishen, B. R. The construction and use of an occupational class scale. Canadian Journal of Economics and Political Science, 1958, 24, pp. 519-531.

Blishen, B. R. A socio-economic index for occupations in Canada. The Canadian Review of Sociology and Anthropology, 1967, 4, pp. 41-53.

Bloom, B. S. Stability and change in human characteristics. New York: Wiley and Sons, 1964.

Dave, R. H. The identification and measurement of environmental process variables that are related to educational achievement. Unpublished doctoral dissertation, University of Chicago, 1963.

Dominion Bureau of Statistics. 1961 Census of Canada: population -- school attendance and schooling. Catalogue #92-550, Vol. I, Part II, 1963.

Dominion Bureau of Statistics. 1961 Census of Canada: population sample -- family incomes by age, sex, occupation, etc. of family head. Catalogue #98-504, Vol. IV, 1964.

Hollingshead, A. B. Elmtown's youth. New York: Wesley and Sons, 1949.

Kahl, J. A., & Davis, J. A. A comparison of indexes. American Sociological Review, 1955, 20, pp. 317-325.

Palmer, Judith A. Home environment and achievement: the first five years. Toronto: The Board of Education for the City of Toronto, Research Department, 1967.

Reiss, A. J. Occupations and social status. New York: Free Press of Glencoe, 1961.

Tuel, J. K., & Wurster, R. Dimensions of the educational environment. California Journal of Educational Research, 1965, 16 (4), pp. 175-188.

Warner, W. L. Social class in America. New York: Harper Bros., 1949.

ADDITIONAL REFERENCES

Barth, E. A. T., & Watson, W. R. Social stratification and the family in mass society. Social Forces, 1967, 45 (3), pp. 392-402.

Boocock, S. S. Toward a sociology of learning: a selective review of existing research. Sociology of Education, 1966, 39, pp. 1-45.

Brim, O. G. The parent-child relation as a social system: parent and child roles. Child Development, 1957, 28, pp. 343-364.

Davis, A. Social class influences upon learning. Cambridge: Harvard University Press, 1948.

Drews, E. M., & Teahan, J. E. Parental attitudes and academic achievement. Journal of Clinical Psychology, 1957, 13, pp. 328-332.

Elder, G. H., Jr. Adolescent achievement and mobility aspirations. Chapel Hill, North Carolina: Institute for Research in Social Science, 1962.

Ferguson, G. A. Statistical analysis in psychology and education. New York: McGraw-Hill, 1959.

Havighurst, R. J., & Davis, A. Social class differences in child-rearing. American Sociological Review, 1955, 20, pp. 438-442.

Hieronymus, A. N. A study of social class motivation: relationships between anxiety for education and certain socio-economic and intellectual variables. Journal of Educational Psychology, 1951, 42, pp. 193-205.

Hollingshead, A. B., & Redlick, F. C. Social class and mental illness. New York: Wiley, 1958.

Kahl, J. A. Educational and occupational aspirations of "common man" boys. Harvard Educational Review, 1953, 23, pp. 186-203.

Lavin, D. E. The prediction of academic performance: a theoretical analysis and review of research. New York: Russell Sage Foundation, 1965.

Malik, M. A. The school performance in families receiving public assistance in Canada. Paper presented at the Fourth Canadian Conference on Educational Research, Toronto, 1966.

Porter, J. The vertical mosaic. Toronto: University of Toronto Press, 1966.

Radin, Norma, & Glasser, P. H. The use of parental attitude questionnaires with culturally disadvantaged families. Journal of Marriage and the Family, 1965, August, pp. 373-382.

Rehberg, R. A., & Westby, D. L. Parental encouragement, occupation, education and family size: artifactual or independent determinants of adolescent educational expectations? Social Forces, 1967, 45 (3), pp. 362-374.

Shoben, E. J., Jr. The assessment of parental attitudes in relation to child adjustment. Genetic Psychology Monogram, 1949, 39, pp. 103-148.

Spector, S. I. A study of firm and permissive home discipline. Journal of Educational Sociology, 1962, 36, pp. 115-123.

Swift, D. F. Social class and achievement motivation. Educational Research, 1966, 8 (2), pp. 83-95

Teahan, J. E. Parental attitudes and college success. Journal of Educational Psychology, 1963, 54, pp. 104-109.

Wolf, R. M. The identification and measurement of environmental process variables related to intelligence. Unpublished doctoral dissertation, University of Chicago, 1963.

APPENDIX A

Warner's Index of Social Class

Warner's Index of Social Class*

Occupation

1 Lawyers, doctors, engineers, superintendents, ministers, architects, business over $75,000, CPA's, regional managers, gentlemen farmers

2 High school teachers, nurses, editors, librarians, businesses from $20,000 to $75,000, assistant managers, assistants to executives, accountants, real estate salesmen, farm owners

3 Grade school teachers, undertakers, optometrists, businesses from $5,000 - $20,000, minor officials of business, auto salesmen, bank and post clerks, JP's, contractors

4 Businesses $2,000 - $5,000, stenos, mail clerks, RR agents, sales clerks, factory foremen, electricians, plumbers, carpenters, butchers, RR engineers and conductors

5 Businesses $500 - $2,000, hardware salesmen, telephone operators, repairmen, firemen, policemen, cooks, bartenders, tenant farmers, barbers

6 Businesses less than $500, semiskilled workers, baggage men, watchmen, taxi and truck drivers, gas station attendants, waitresses, small tenant farmers

7 Heavy labor, migrant work, miners, janitors, newsboys, migrant farm workers

Source of Income

1 Inherited wealth: savings and investments from previous generation

2 Earned wealth: savings and investments from present generation, considerable wealth earned by the individual, can retire on own wealth

3 Profits and fees: services and advice of professional men, royalties to writers, businesses for sale of goods

4 Salary: regular income paid for services on monthly or yearly basis, commissions

5 Wages: paid by hourly rate or a daily or weekly basis

6 Private relief: paid by friends or relatives

7 Public relief and non-respectable income: gambling, prostitution, bootlegging

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* Warner, W. L., Meeker, M., and Eells, K. Social Class in America. Chicago: Science Research Associates, Inc., 1949.

House Type

1 Excellent houses: good repair, large lawns and yards, landscaped

2 Very good houses: somewhat smaller than 1, larger than utility demands

3 Good houses: only slightly larger than utility demands, conventional

4 Average houses: 1½ to 2 storey wood-frame and brick single family

5 Fair houses: smaller houses in excellent condition

6 Poor houses: badly rundown, but can be repaired, lack of care

7 Very poor houses: cannot be repaired, unhealthy and unsafe, shacks

Education

1 Professional or graduate school

2 College education (1 to 4 years)

3 High school graduate

4 One to three years of high school

5 Grammar school graduate (finished 8th grade)

6 Four to seven years of school

7 Zero to three years of school

Weights for Computation of the Index of Social Class

Status Characteristics	Weight	x Score	= Sub-Total
Occupation	4	____	_____
Source of Income	3	____	_____
House Type	3	____	_____
Education	2	____	_____
			_____

Social Class Equivalents for the Index of Social Class

Weighted Total	Social Class
12 - 17	Upper Class
18 - 22	Upper Class, possibly Upper-Middle
23 - 24	Indeterminate: either Upper or Upper-Middle
25 - 33	Upper-Middle
34 - 37	Indeterminate: either Upper-Middle or Lower-Middle
38 - 50	Lower-Middle
51 - 53	Indeterminate: either Lower-Middle or Upper-Lower
54 - 62	Upper-Lower
63 - 66	Indeterminate: either Upper-Lower or Lower-Lower
67 - 69	Lower-Lower, possibly Upper-Lower
70 - 84	Lower-Lower

APPENDIX B

Statistical Tables

TABLE 1

FREQUENCY AND RANKING BY CUMULATIVE PERCENTAGE: FAMILY INCOME

Income	Frequency (Study of Achievement Sample) (N 701)	Cumulative %* (Study of Achievement, 1967)	Cumulative % (Ontario, Urban, DBS, 1961)
Less than $2,999	45	6.42	10.68
$3,000 - $3,999	48	13.26	24.27
$4,000 - $4,999	129	31.38	42.50
$5,000 - $5,999	136	50.78	59.44
$6,000 - $6,999	104	65.61	71.82
$7,000 - $7,999	79	76.89	80.71
$8,000 - $9,999	79	88.16	90.22
$10,000 - $14,999	48	95.00	96.91
More than $15,000	33	99.71	99.96

QUESTION: What was your family income before taxes last year to the nearest thousand?

* Chi-square showed no difference in distribution of family income between these two samples. The calculation formula used was:

$$X^2 = 2 \left(\sum_{i=1}^{n} \frac{ai^2}{ai + bi} + \sum_{i=1}^{n} \frac{bi^2}{ai + bi} - 100 \right)$$

where n = 9

ai = % falling in a category of Study of Achievement data

bi = % falling in a category of Urban, Ontario, DBS data

This is a rearrangement of the standard X^2 formula.

TABLE 2

RANKING BY CUMULATIVE PER CENT:
EDUCATIONAL LEVELS OF THE FATHER

Categories of Answer*	Cumulative %** (Study of Achievement, 1967)	Cumulative % (Ontario, Urban, DBS, 1961)
1 -- eight years or less	43.34	44.01
2 -- some high school education 3 -- high school graduate	91.89	90.80
4 -- some post high school training	94.30	94.25
5 -- college graduate 6 -- some post college work 7 -- advanced degree	99.99	99.99

TOTAL (N = 703)

QUESTION: To what level did your husband go in school? (Do not read list.)

* As mentioned in the text, more categories may be employed on this dimension when the categories of answer are rephrased.

** Chi-square showed no difference in distribution of educational levels between these two samples.

TABLE 3

MEAN SEI VALUE FOR EACH OCCUPATIONAL LEVEL OF THE FATHER

Categories of Answers	Mean SEI* from Blishen's (1957) SEI
1 -- sweeper, garbage man, parking lot attendant	29.04
2 -- labourer, assembly line worker, apartment janitor	29.65
3 -- electrician, plumber, carpenter, trucker, mechanic	33.08
4 -- bank teller, salesman, filing clerk	43.03
5 -- manager of small store, teacher, administrator of small business	49.75
6 -- manager of department store, owner of medium size store, chemist	63.34
7 -- doctor, lawyer, architect, business executive	73.20
8 -- writer, actor, musician, artist	54.31
9 -- athlete, hockey player	51.11
10 -- unemployed	---
11 -- retired	---
12 -- not stated	53.45

QUESTION: What is your husband's occupation (write in)?

* The method of calculation is as follows: each occupational title in the ten categories used above was located on Blishen's SEI for Occupations in Canada (Canadian Review of Sociology and Anthropology, 1967, 4, pp. 41-53). The average or mean value for each of our ten categories was then calculated, e.g., for category 1

Occupational Title	Blishen Value	Blishen $\bar{X}$
sweeper	29.92	
garbage man	26.71	
parking lot attendant	30.48	
	Σ 87.11	29.04

TABLE 4

A COMPARISON OF THE DISTRIBUTION OF SEI VALUES
FOR THE STUDY OF ACHIEVEMENT SAMPLE AND THE ONTARIO SAMPLE

SEI	Percentage Distribution of Study of Achievement Sample by SEI (1967)*	Percentage Distribution of Ontario Labour Force by Socio-Economic Index (1961)**
Below 30	18.0	26.0
30 - 39	49.0	35.0
40 - 49	17.6	20.0
50 - 59	6.4	10.0
60 - 69	4.5	5.0
Above 70	4.5	4.0

Chi-square for comparison of these two distributions showed no significant difference.

* Based on Table 3, Appendix B.

** Source is B. Blishen (1967) p. 52.

TABLE 5

CORRELATIONS AMONG INCOME, EDUCATION AND SOCIO-ECONOMIC INDEX (SEI)

	SEI	Income	Education
SEI	1.000	.2536*	.3683*
Income		1.0000	.3177*
Education			1.0000

* $p \leq .01$ N = 664

NOTE: The values of these correlations are restricted because there are only ten categories of SEI, nine categories of income, and four categories of education. The correlations cited above are in line with previous research findings (Reiss, [illegible], p. [illegible]).

APPENDIX C

Detailed Procedures Used to Establish the Validity
of Using Blishen's Socio-Economic Index
with the Study of Achievement Sample

Detailed Procedures Used to Establish the Validity of Using Blishen's Socio-Economic Index With the Study of Achievement Sample

In order to use an index of SES with a particular sample population, a number of conditions must be satisfied. The most important of these conditions is that the sample population to which the scale is to be applied must be selected according to criteria used in validating the original scale. This Appendix gives a more detailed description of the procedures used in establishing the validity of employing Blishen's (1967) SEI with the Study of Achievement sample population.

As stated in the main text, researchers have used a number of different factors in a variety of different combinations to devise scales to measure SES. The factors selected by Blishen for his index were those of father's occupation, father's education and father's income. Information concerning income for the Study of Achievement sample population was gathered in terms of total family income from all sources as opposed to only father's income; therefore in order to determine whether the Study of Achievement sample population was representative with respect to the Ontario urban population and so whether it was feasible to use Blishen's SEI with the Study of Achievement population, the distribution of family income within the Study of Achievement was compared with that of the Ontario urban population. As reported in Table 1, Appendix B, a chi-square test for comparison of percentages produced no significant differences. Similar comparisons for the distributions of father's education, father's occupation, mother's education and mother's occupation also revealed no significant differences between the Study of Achievement population and the Ontario urban population.

Two regression analyses were undertaken using the variables mentioned above. In the first analysis, the hypothesis was that father's education and family income would account for a significant proportion of the variance

in occupational status. Since the variables of mother's education, and mother's occupation typically have not been included in the construction of SES scales it was hypothesized that they would not contribute significantly to the reduction of variance in predicting SEI. These variables were included in this analysis in order to demonstrate that once family income and father's education were taken into account, there would be little reduction in variance in predicting SEI accomplished by employing additional variables.

In constructing his index using the 1951 census data, Blishen calculated the mean income and mean education for incumbents of each occupation and then converted each of these measures to a standard score.

> "To construct the 1961 index, instead of scores based on mean income and mean education, the percentage of males in each occupation whose income was reported to be $5000 or over during the preceding twelve month period and the percentage who had attended at least the fourth year of high school, were calculated. Thus, the income and education variables were both expressed as a percent rather than as a function of a mean."
>
> (Blishen, 1967, p. 43)

In validating the use of Blishen's index for the Study of Achievement sample, it was necessary to deviate from the 1961 procedure since the information obtained in the Study of Achievement regarding the education variable was different from that used by Blishen. It was possible to identify someone with incomplete high school, but it was not possible to identify someone with at least four years of high school. In addition, the measure of income in the Study of Achievement sample was <u>family</u> income and not father's income as in Blishen's index. It was therefore necessary to describe each of these variables, family income and father's education, in such a way that they might be entered in a regression analysis using Blishen's mean SEI values for the ten categories of occupation (see Table 3, Appendix B) as the criterion variable. Since no

difference was found between the Study of Achievement population and the Ontario urban population with respect to the distribution on the variables family income and father's educational level, the cumulative percentages for each level of family income and father's education shown in the column Cumulative Per cent, Ontario, Urban, D.B.S., 1961, of Tables 1 and 2, Appendix B were entered in the regression analysis.

The results of the first analysis showed that:

(i) Family income and father's education contributed significantly to the reduction of the variance in predicting the father's occupational status.

(ii) Father's education was the most effective predictor variable, and accounted for a 15% reduction in the variance associated with the father's occupational status. ($N = 669$, $p < .01$)

(iii) Since father's education and mother's education are correlated ($r = .45$, $N = 669$, $p < .01$), father's education could be approximated by mother's education if the father's education were unknown.

(iv) After father's education and family income had been considered, mother's education and mother's occupation did not contribute further to the reduction of variance associated with father's occupational status.

(v) The reduction in the variance associated with the father's occupational status achieved by employing these four variables as predictors was small (17.84%) but, because of the large sample size ($N = 669$), reached the 1% level of statistical significance.

(vi) The equation using these four variables was as follows:

SEI = (.061) Family income + (.145) Father's education +
(.018) Mother's education + (.014) Mother's occupation
+ 18.27

On the basis of the above findings, a second regression analysis was undertaken, using only the variables family income and father's education, to determine the coefficients which when substituted in a regression equation would provide the best prediction of Blishen's SEI*. As in the first regression analysis, the data for family income and father's education entered in the regression equation were expressed as cumulative percentages in the Ontario urban population (see Tables 1 and 2, Appendix B). The coefficients obtained from this second analysis were 0.072 for family income and 0.154 for father's education. The intercept was 23.311. This equation would be written as follows:

SEI = (0.072) Family income + (0.154) Father's education + 23.311

These two variables accounted for a 15.64% reduction in variance ($p < .01$, $N = 669$) in predicting Blishen's SEI values. The standard error of the estimate was 10.55. It should be noted that although the criteria established for use with the Study of Achievement data on income and education were different from those of Blishen, the resulting regression coefficients obtained were still in the ratio of 1:2 as were Blishen's.

Two steps were involved when using regression analysis to determine whether Blishen's SEI could be used with the Study of Achievement population. The first, which has been described above, was the determining of the regression weights which would give the best estimate of the criterion, occupational status of the father. The second step was to check that these weights actually did assign a value which would maintain the rank order of occupations described by Blishen. To complete this step, an SEI value was calculated for every individual in the Study of Achievement sample employing the regression weights

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* It should be recalled (see p. 8) that Blishen's regression equation and coefficients are as follows:

SEI = (.202) Father's income + (.347) Father's education + 24.62

(Blishen, 1967, p. 44)

which were established in the second analysis. This calculated SEI value was then compared with the SEI value which would be assigned by the Blishen scale according to the individual occupational title. The results of this comparison indicated that there was a very close approximation between these two SEI values, although as in all solutions to regression equations, the approximations were best in the range of the most frequently occurring values. Less than 5% of the calculated SEI values were more than two standard deviations from the criterion category mean. The rank ordering of the occupational titles was maintained, i.e., doctors remained higher in status than department store managers, who in turn were higher than sales clerks, etc. Taking into account that only ten categories were used to represent the range of occupational titles in the Study of Achievement sample, (see Table 3, Appendix B) the results of the second regression analysis were interpreted as appropriate support for employing the Blishen SEI for further analysis of the home environment of the 669 school children in the Study of Achievement sample population.